CLAIMS

We claim:

1. A method for formulating a molecular sieve catalyst composition, the method comprising the steps of:
   (a) providing a synthesized molecular sieve having been recovered in the presence of a flocculant;
   (b) thermally treating the synthesized molecular sieve;
   (c) making a slurry of the thermally treated synthesized molecular sieve, a binder, and optionally a matrix material,
   (d) forming the slurry to produce a formulated molecular sieve catalyst composition.

2. The method of claim 1 wherein the synthesized molecular sieve is synthesized from a synthesis mixture comprising a silicon source, a phosphorous source and an aluminum source, optionally in the presence of a templating agent.

3. The method of claim 1 wherein the slurry in step (d) is formed by spray drying to form a spray dried formulated molecular sieve catalyst composition.

4. The method of claim 3 wherein the spray dried formulated molecular sieve catalyst composition is calcined.

5. The method of claim 1 wherein the synthesized molecular sieve is selected from one or more of the group consisting of: a metalloaluminophosphate, an aluminophosphate, a CHA framework-type molecular sieve, an AEI framework-type molecular sieve and a CHA and AEI intergrowth or mixed framework-type molecular sieve.

6. The method of claim 1 wherein the amount of synthesized molecular sieve in step (a) is greater than 250 Kg.

7. The method of claim 1 wherein in step (b) the synthesized molecular sieve is thermally treated to a temperature in the range of from 80°C to 150°C.

8. The method of claim 1 wherein the thermally treated molecular sieve has a carbon content in the range of from 0.1% to about 50%.

9. The method of claim 1 wherein the thermally treated molecular sieve has a LOI in the range of from 10% to 50%.

10. A method for synthesizing a molecular sieve, the method comprising the steps of:
    (a) crystallizing the molecular sieve in a slurry, the slurry comprising one or more of a silicon source, an aluminum source, and a phosphorous source;
    (b) contacting a flocculant with the molecular sieve;
    (c) recovering the molecular sieve; and
    (d) heat treating the molecular sieve.

11. The method of claim 10 wherein the slurry comprises a silicon source, an aluminum source, a phosphorous source and a templating agent.

12. The method of claim 10 wherein the in step (c), the molecular sieve is recovered by filtration.

13. The method of claim 10 wherein the amount of molecular sieve recovered is greater than 250 Kg.

14. The method of claim 10 wherein in step (d) the molecular sieve is heated to a temperature in the range of from 80°C to 150°C.

15. The method of claim 10 wherein the molecular sieve after step (d) has a carbon content in the range of from 0.1% to about 50%.

16. The method of claim 10 wherein the molecular sieve after step (d) has a LOI in the range of from 10% to 50%.

17. The method of claim 10 wherein the molecular sieve is combined with a matrix material, and optionally a binder to form a formulated catalyst composition.

18. The method of claim 17 wherein the formulated molecular sieve catalyst composition is spray dried.

19. The method of claim 18 wherein the formulated molecular sieve catalyst composition is calcined.

20. A method for formulating a molecular sieve catalyst composition, the method comprising the step of:

(A) synthesizing a molecular sieve in a reaction vessel, the method comprising the steps of:

(a) crystallizing the molecular sieve in a synthesis mixture;

(b) settling the molecular sieve in a reaction vessel by introducing a flocculant to the synthesis mixture;

(c) recovering the molecular sieve;

(d) thermally treating the molecular sieve; and

(B) combining the thermally treated molecular sieve with a binder and a matrix material to form the molecular sieve catalyst composition.

21. The method of claim 20 wherein the molecular sieve in step (c) is recovered by filtering the synthesis mixture.

22. The method of claim 20 wherein prior to step (c) a portion of a liquid in the synthesis mixture is separated from the molecular sieve, and additional flocculant and/or additional liquid, is introduced to the synthesis mixture.

23. The method of claim 20 wherein the reactor vessel is capable of producing greater than 250 Kg in one batch.

24. The method of claim 20 wherein in step (B) the molecular sieve catalyst composition is spray dried to form a spray dried molecular sieve catalyst composition.

25. The method of claim 24 wherein the spray dried molecular sieve catalyst composition is calcined.

26. The method of claim 20 wherein the molecular sieve is selected from one or more of the group consisting of: a silicoaluminophosphate, an aluminophosphate, a CHA framework-type molecular sieve, an AEI framework-type molecular sieve and a CHA and AEI intergrowth or mixed framework-type molecular sieve.

27. The method of claim 20 wherein the molecular sieve in step (d) is thermally treated at a temperature in the range of from 80°C to 150°C.

28. The method of claim 10 wherein the molecular sieve after step (d) has a carbon content in the range of from 0.1% to about 50%.

29. The method of claim 10 wherein the molecular sieve after step (d) has a LOI in the range of from 10% to 50%.

30. A process for converting a feedstock in the presence of the molecular sieve catalyst composition of claim 1.

31. A process for converting a feedstock in the presence of the molecular sieve of claim 10.

32. A process for converting a feedstock in the presence of the molecular sieve catalyst composition of claim 20.

33. A process for producing one or more olefin(s), the process comprising the steps of:

(A) introducing a feedstock to a reactor system in the presence of the formulated molecular sieve catalyst composition of claim 1;

(B) withdrawing from the reactor system an effluent stream; and

(C) passing the effluent gas through a recovery system recovering at least the one or more olefin(s).

34. The process of claim 33 wherein the feedstock comprises one or more oxygenates.

35. The process of claim 33 wherein the synthesized molecular sieve is synthesized from a synthesis mixture comprising a silicon source, a phosphorous source and an aluminum source, optionally in the presence of a templating agent.

36. The process of claim 33 wherein the synthesized molecular sieve is selected from one or more of the group consisting of: a silicoaluminophosphate, an aluminophosphate, a CHA framework-type

molecular sieve, an AEI framework-type molecular sieve and a CHA and AEI intergrowth or mixed framework-type molecular sieve.

37. The process of claim 33 wherein the amount of crystallized molecular sieve in step (a) is greater than 250 Kg.

38. The process of claim 33 wherein in step (b) the synthesized molecular sieve is thermally treated to a temperature in the range of from 80°C to 150°C.

39. The process of claim 33 wherein in step (b) the thermally treated molecular sieve having a carbon content in the range of from 0.1% to about 50% and a LOI in the range of from 10% to 50%

40. An integrated process for making one or more olefin(s), the integrated process comprising the steps of:
    (a) passing a hydrocarbon feedstock to a syngas production zone to producing a synthesis gas stream;
    (b) contacting the synthesis gas stream with a catalyst to form an oxygenated feedstock; and
    (c) converting the oxygenated feedstock into the one or more olefin(s) in the presence of a molecular sieve catalyst composition made by the method comprising the steps of :
        (i) providing a synthesized molecular sieve having been recovered in the presence of a flocculant;
        (ii) thermally treating the synthesized molecular sieve;
        (iii) making a slurry of the thermally treated synthesized molecular sieve, a binder, and optionally a matrix material,
        (iv) forming the slurry to produce a formulated molecular sieve catalyst composition.

41. The integrated process of claim 40 wherein the process further comprises the step of: (d) polymerizing the one or more olefin(s) in the presence of a polymerization catalyst into a polyolefin.

42. The integrated process of claim 40 wherein the oxygenated feedstock comprises methanol, the olefin(s) include ethylene and propylene, and the molecular sieve catalyst composition is a silicoaluminophosphate molecular sieve.

43. The integrated process of claim 40 wherein the molecular sieve catalyst composition has an ARI in the range of from about 0.01 to 0.5 weight percent per hour.

44. The integrated process of claim 40 wherein the amount of synthesized molecular sieve in step (i) is greater than 250 Kg.

45. The integrated process of claim 40 wherein in step (ii) the synthesized molecular sieve is thermally treated to a temperature in the range of from 80°C to 150°C.

46. The integrated process of claim 40 wherein the thermally treated molecular sieve has a carbon content in the range of from 0.1% to about 50%.

47. The integrated process of claim 40 wherein the thermally treated molecular sieve has a LOI in the range of from 10% to 50%.

48. The integrated process of claim 40 wherein the synthesized molecular sieve is synthesized from a synthesis mixture comprising a silicon source, a phosphorous source and an aluminum source, optionally in the presence of a templating agent.

49. The integrated process of claim 40 wherein formulated molecular sieve catalyst composition is calcined.

50. The integrated process of claim 40 wherein the flocculant is anionic or cationic.